IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

<div align="right">PATENT</div>

In re application of: Lee et al.	Attorney Docket No.: DEM1P003
Application No.: 09/741,956	Examiner: Robinson Boyce, Akiba K.
Filed: December 20, 2000	Group: 3628
Title: ECONOMETRIC ENGINE	Confirmation No.: 7270

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APPEAL BRIEF UNDER 37 C.F.R. 41.37

Further to Notice of Appeal filed in this application on April 28, 2008, this Appeal Brief is being submitted to the Board of Patent Appeals and Interferences.

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Dear Sirs:

Appellants hereby appeal the decision of the primary examiner mailed December 28, 2007. The Appeal Board is thanked for their review of the application.

I. REAL PARTY IN INTEREST

The real party in interest is DemandTec Corporation, a corporation of the state of Delaware, the assignee of all rights, title and interest in the present application from applicants Hau Lee, Krishna Venkatraman, Michael Neal, Suzanne Valentine, and Phil Delurgio recorded in the United States Patent and Trademark Office at reel/frame 011738/0316.

II. RELATED APPEALS AND INTERFERENCES

Based upon information and belief, there are no appeals or interferences that could directly affect or be directly affected by or have a bearing on the decision by the Board of Patent Appeals and Interferences in the pending appeal.

III. STATUS OF THE CLAIMS

The final rejection of Claims 1-4, and 6-11 is being appealed. These appealed claims are reproduced in the Claims Appendix hereto. Original claims 1-4 and 6-11 remain in the present application. Status of the claims is as follows:

a) Claims 1-4 and 6-11 have been rejected.

b) Claim 5 has been previously cancelled.

c) All rejected claims 1-4, and 6-11 are being appealed.

IV. STATUS OF THE AMENDMENTS

No amendment has been filed since the mailing on December 28, 2007 of the final Office Action herein.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

A. Regarding Independent Claim 1

The appealed independent Claim 1 relates to the pricing of products for retailers and wholesalers. (page 2, lines 15-18). Proper pricing of goods and services is integral to the success of a business. As such, pricing systems, including price optimization systems, are highly valued by businesses and fulfill an important role in business decision making and planning.

Claim 1 of this application addresses a method for creating a product sales model for a plurality of products. (page 3, lines 17-20). This method is unique in that a single demand group sales model is generated for each category containing a plurality of demand groups. (page 59, lines 15-18; page 65, lines 5-15). These demand grouping categories are groupings of highly substitutable products. (page 61, lines 14-18).

Furthermore, a market share model is generated which determines the fraction of the sales of each demand group comprised by each product. (page 70, lines 3-15).

Thus, the method is capable of generating the product sales model by combining the demand group sales model and the market share model. (page 72, lines 5-8; page 59, lines 5-13).

The benefit of generating the product sales model in this fashion is that the invention sidesteps the need to generate demand coefficients for each individual product, but rather generates demand coefficients for a lesser number of demand groups. The market share model may then be used to determine individual product sales models.

Other systems require generating demand coefficients for each product to generate sales models for those products. This may be extremely costly in terms of time and computing

resources. As such, the present invention provides a dramatic improvement over prior demand modeling systems.

In particular, Claim 1 states "**Creating**, using the computer system, **a plurality demand groups, wherein each demand group is a group of highly substitutable products**, further wherein each demand group is a set of, at least one product and at least one of the demand groups is, a set of at least two products, further wherein each said demand group is defined by a user such that, each said demand group is unique to said user; **Creating**, using the computer system, **a demand group sales model** as a function of price **wherein said demand group sales model models sales for each demand group**, further wherein said demand group sales model provides a single model for modeling sales of all of the products in each said demand group; **Creating**, using the computer system, **a market share model wherein said market share model determines the fraction of the sales of each demand group comprised by each product**; and **Creating**, using the computer system, **said product sales model by combining said demand group sales model and said market share model**, wherein said product sales model models sales for individual products, further wherein said product sales model combines said demand group sales model and said internal market share model to produce said product sales model for individual products." (Emphasis Added). (page 59, line 5 to page 72, line 8).

B. Regarding Independent Claim 3

The appealed independent Claim 3 is a computer program product for the econometric engine of the optimization system. As such, claim 3 relates to the pricing of products for retailers and wholesalers. (page 12, lines 1-6).

The econometric engine of Claim 3 includes an imputed variable generator and a coefficient generator. (Figure 3; page 12, lines 1-6). The imputed variable generator generates econometric variables including base price variable, and base volume variable. (page 28, lines 5-17; page 39, lines 11-17).

The coefficient estimator substantially performs the method outlined in Claim 1. Thus, the coefficient estimator is unique in that a single demand group sales model is generated for each category containing a plurality of demand groups. (page 59, lines 15-18; page 65, lines 5-15). These demand grouping categories are groupings of highly substitutable products. (page 61, lines 14-18).

Furthermore, a market share model is generated by the coefficient estimator which determines the fraction of the sales of each demand group comprised by each product. (page 70, lines 3-15).

Thus, the coefficient estimator is capable of generating the product sales model by combining the demand group sales model and the market share model. (page 72, lines 5-8; page 59, lines 5-13).

As noted, the benefit of generating the product sales model in this fashion is that the invention sidesteps the need to generate demand coefficients for each individual product, but rather generates demand coefficients for a lesser number of demand groups. The market share model may then be used to determine individual product sales models.

Other systems require generating demand coefficients for each product to generate sales models for those products. This may be extremely costly in terms of time and computing resources. As such, the present invention provides a dramatic improvement over prior demand modeling systems.

In particular, Claim 3 states "Computer program instructions which, when executed by a computer, cause the computer to generate an **econometric engine for modeling sales** as a function of price, the engine further **comprising: an imputed variable generator for generating imputed econometric variables including a base price variable and a base volume variable**, wherein said base volume variable represents the volume of product units sold in the absence of discount pricing or other promotional effects; **and a coefficient estimator coupled to the imputed variable generator**, and wherein imputed variables generated by the variable generator are used by the coefficient estimator **to create a demand group sales model**

as a function of price, wherein said demand group sales model **provides a single model for modeling sales of all of the products in each said demand group,** further wherein each said demand group is defined by a user such that each said demand group is unique to said user , an internal **market share model**, **and** a combined product sales model wherein said product sales model models sales for individual products, further wherein said combined product sales model **combines said demand group sales model and said internal market share model to produce said product sales model for individual products**." (Emphasis Added). (page 12, line 1 to page 72, line 8).

C. Regarding Dependent Claims 2, 4, and 6-11

Claim 2 states "further comprising the steps of: **Collecting**, using the computer system, **raw data**, wherein said raw data includes product parameter data which is missing or incomplete; and **Generating**, using the computer system, **imputed variables from the raw data**, wherein said imputed variables are used to estimate said missing or incomplete data, further **wherein the imputed variables are used to create the product sales model.**" (Emphasis Added). (Figure 10; page 12, lines 3-20).

Claim 6 adds that the process "further comprising the steps of: defining an **equivalizing factor** for the products of each demand group." (page 17, lines 12-22).

Claim 7 further clarifies by stating that the "imputed variables comprise an imputed base price variable and an imputed base volume variable." (page 28, lines 5-17; page 39, lines 11-17).

Claim 8 goes on to state that the process "further comprising the steps of: generating a moving average for base price; and generating a moving average for base volume." (Figure 12A; page 31, lines 2-11; page 41, line 20 to page 42, line 4).

Claim 10 states that the method "further comprising the steps of: defining an equivalent price for each said product using said equivalizing factor; (page 35, lines 2-5) defining equivalent units sold for each said product using said equivalizing factor; (page 35, lines 10-16)

defining an equivalent base price for each said product using said equivalizing factor; (page 38, lines 7-12) defining equivalent base units sold for each said product using said equivalizing factor; (page 36, lines 1-4) creating a demand group equivalent sales model based on said equivalent price and said equivalent units sold; (page 66, lines 5-7) indexing said demand group equivalent sales model by divided said demand group equivalent sales by baseline demand group equivalent sales; (page 66, lines 8-11) creating an equivalent internal market share model based on said equivalent price and said equivalent units sold; (page 68, lines 12-15; page 70, lines 3-5) and creating, using the computer system, an equivalent product sales model by combining said demand group equivalent sales model and said equivalent internal market share model, wherein said equivalent product sales model models equivalent sales for individual products." (page 72, lines 5-8).

Regarding the computer product of Claim 3, Claim 4 goes on to state that "the imputed variable generator receives raw data, and cleans the data" for independent Claim 3. (page 13, lines 5-8).

Claim 9 goes on to state "wherein said raw data includes missing or incomplete data sets." (page 23, line 19 to page 24, line 11).

Claim 11 further clarifies by stating that "said imputed variable generator generates additional econometric variables including an imputed consumer stockpiling variable, an imputed day of the week variable, an imputed seasonality variable, an imputed promotional variable, and an imputed cross-elasticity variable; and wherein said econometric engine utilizes a mixed-model framework wherein data across all stores and products for a selected demand group is utilized simultaneously." (page 43, line 20 to page 59, line 3).

Appellants assert that all pending Claims 1-4 and 6-11 are novel and non-obvious over the cited art for all the reasons given below.

VI.   GROUNDS OF REJECTION TO REVIEWED ON APPEAL

The Board is being asked to review the final rejection of Claims 1-4, and 6-11 under 35 U.S.C. 112, and under 35 U.S.C. 103 as being unpatentable over Ouimet et al. (US 6,078,893), in view of Garg, (US 6,044,357), and further in view of Chavez et al. (US 6,684,193).

VII.   REMARKS/ARGUMENTS

Appellants thank the Appeal Board for the review of this Appeal Brief. Appellants will now address the patentability of the present invention, with particular attention paid to the rejections made by the Examiner in response to the Amendment dated October 17, 2007, which is hereby incorporated by reference.

For the sake of clarity, Appellants have divided the arguments into various subsections; however, this is not intended to be limiting of the arguments contained therein. Thus, arguments in one subsection may be applied to all applicable subsections.

A. RESPONSE TO REJECTION OF THE CLAIMS UNDER 35 USC §112

Examiner rejected Base Claim 1 under 35 USC §112, both under first and second paragraphs. Appellants believe that there is no basis for such rejections. However, Appellants believe a pragmatic and reasonable amending of the claims would be acceptable should the Appeal Board believe it would aid in alleviate concerns under 35 USC §112.

As such, Appellants assert that the purported error in antecedent basis requires the deletion of the term "internal" to be rectified. Appellants would be willing to make such an amendment, if required, to expedite the prosecution of the application.

B. RESPONSE TO REJECTION OF THE CLAIMS UNDER 35 USC §103

The examiner has additionally rejected all pending Claims 1-4 and 6-11 under 35 U.S.C. § 103(a) as being unpatentable over Ouimet et al. (US 6,078,893), in view of Garg, (US 6,044,357), and further in view of Chavez et al. (US 6,684,193).

Appellants believe that the present invention is nonobvious over Ouimet et al., Garg and Chavez et al. because the cited references neither teach nor suggest each and every element of claim 1 or 3.

"A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *Graham v. John Deere Co.,* 383 U.S. 1, 13 (1966). Further, "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." *In re Royka,* 490 F.2d 981 (C.C.P.A. 1974); MPEP 2143.03.

Appellants believe that there is no basis for an obviousness rejection. In response to this rejection, Appellants will provide a brief discussion of the prior art and discuss the specific rejections of related claims below.

1. DISCUSSION AND CHARACTERIZATION OF THE CITED PRIOR ART

The main reference relied upon by the Examiner in the rejection of the present invention is Ouimet et al. Ouimet et al. discloses "a system of coupled equations that **describe the demand for each <u>item</u>** . . ." (Emphasis Added). (See Column 5, lines 60 to 63). Ouimet et al. discloses the possible use of a "demand model in which there is nonlinear cross-correlation between the variables of different items;" however, in Ouimet et al. demand models are still generated for *each item.* (See column 6, lines 12-16). There appears to be no suggestion in Ouimet et al. of determining a demand model for the entire 'group'.

Moreover, Ouimet et al. appears to "**tune** the demand model **to sales history**" using a "figure-of-merit function." (Emphasis added). (See Column 6, lines 63-65). Figure-of-merit functions are well known in the art as used to characterize the performance of a model relative to actual data.

Garg, on the other hand, discloses "marketing mix variables, each of said variables representing marketing strategies for each of a plurality of brands of goods" (See Column 14, lines 45-47). Additionally, Garg discloses "then selecting another sub-plurality of marketing mix variables, representing another marketing strategy, and calculates another estimated total profit/loss value." (See Column 3, lines 39-41). It appears that Garg discloses an **iterative process** of selecting groupings of **brands** and determining profits. At the end of the iterative process, the **grouping of brands with the highest profits is identified**. Garg discloses **grouping of brands**, not individual products.

Moreover, these groupings, as disclosed in Garg, make no hint, mention, suggestion, or reference of grouping by **substitutable** products. (see Column 3, lines 12-13).

Lastly, Chavez et al. relates generally to the allocation of resources for a manufacturing process. (See Column 6, lines 44-50). Appellants argue that the field of invention disclosed in Chavez et al. differs greatly from that of pricing optimization as disclosed in the present invention.

2. REGARDING THE COMBINATION OF CITED ART

Appellants assert that there is insufficient evidence of record of a motivation to combine Ouimet et al., Garg and Chavez et al. in a manner meeting the invention as recited in claim 1 or 3.

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art

to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007). In *KSR*, the Supreme Court emphasized that "the principles laid down in *Graham* reaffirmed the 'functional approach' of *Hotchkiss*, 11 How. 248." *KSR,* 127 S.Ct. at 1739, 82 USPQ2d at 1395 (citing *Graham*, 383 U.S. at 12, 148 USPQ at 464). The operative question in this "functional approach" is thus "whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.* at 1740, 82 USPQ2d at 1396. The Court noted that "[t]o facilitate review, this analysis should be made explicit." *Id.*, citing *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be **some articulated reasoning** with some rational underpinning to support the legal conclusion of obviousness") (Emphasis Added).

None of the cited art disclose all of the limitations of claims 1 or 3. Furthermore, even if one were to construe the disclosures of the cited art to disclose said limitations, there is no disclosure of a motivation to combine in a manner which gives the functionality of the instant invention. None of the sales models disclosed in the cited art functions in such a way as to combine a group sales model and an individual product market share model in order to produce an overall product sales model. As such, any asserted combination fails to meet the 'functionality test' outlined in *KSR, supra.*

3. REGARDING CLAIMS 1 AND 6

Claims 1 and 6 have been rejected by the examiner in light of Ouimet et al. (US 6,078,893), in view of Garg, (US 6,044,357). Appellants believe this rejection is erroneous and unfounded. Below is a listing of arguments where Ouimet et al. and Garg are contrasted with the Claimed invention. It will become clear that Ouimet et al. and Garg do not make the present invention obvious in that they differ greatly in regard to scope, breadth, thrust and means of accomplishing their respective objectives.

i. Ouimet et al. Fails to Suggest Creating Demand Groups

The Examiner rejected Claim 1 stating "Ouimet et al. discloses: Creating, using the computer system, a plurality of demand groups . . . (col. 5, lines 45-64, [shows demand is described for each item in a given group…" The Examiner did admit that Ouimet et al. does not "specifically disclose wherein each demand group is a user defined group of highly substitutable products." However, the Examiner maintained that Ouimet et al. "does disclose defining a new market model that represents and describes how the demand parameters are expected to vary, where the demand parameters relate to the products in each demand group in col. 6, lines 17-25."

Appellants respectfully disagree with the Examiner's statement, in that Ouimet '893 does not teach or suggest the generation of demand groups, as claimed, in any way. Not only is there no description of grouping products by substitutability, Ouimet et al. appears to only discuss performing product grouping for "micro-marketing". (See Column 8, lines 29-37). Micro-marketing, which is well known in the field, is a mere subdivision of the market and treating each subdivision as an entire market. All products within the sub-market are solved in a demand model. The grouping is not treated as a single entity for demand modeling, as in the present invention.

Thus, the grouping in Oiumet et al. is performed differently, and is for a different purpose than that of the demand groups in Claim 1. Appellants argue that this makes the "creating demand groups" of the present invention nonobvious and distinct from Ouimet et al.

As such, Claim 1 is believed allowable over the cited art. Dependent claims 2, 6-8 and 10, as depending from an allowable parent claim, are also allowable for at least the same reasons.

ii. Garg Fails to Suggest Demand Groups

Moreover, the Examiner also rejected Claim 1 stating that "Garg discloses: wherein each demand group is a group of highly substitutable products, (Col. 13, lines 65, shows inventory maintenance is implemented for products which means that these **products are replaceable**

through inventory stock, w/Col. 14, lines 55-58 and col. 15, lines 17-18 and lines 24-26, shows the selection of a first marketing mix, a selection of another marketing mix, and then the identification of which marketing mix generates the largest profit/loss, in this case, one marketing mix for products can be substituted for another marketing mix for the highest profit or loss outcome). **Garg discloses this limitation in an analogous art for the purpose of showing that products within marketing mixes are interchangeable**. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention for each demand group to be a group of highly substitutable products with the motivation of having the ability to replace the products when needed." (Emphasis added).

Appellants disagree with the examiner's conclusion, and believe that generating demand groups of highly substitutable products is nonobvious in light of Garg. When inventory stock is replaced, of course the new items are the same as the old. This, however, is not an analogous art since the present invention discloses generating demand models while the given example is restocking a store.

Moreover, the motivation of restocking in Garg, as described by the examiner, is to "replace the products when needed." The present invention does not **replace** products. Likewise, motivation for grouping substitutable products is to aid efficiency when generating demand models. This motivation is not apparent in Garg.

Further, the "mixed variables" selected in Garg are "marketing strategies." See Column 13, lines 59-62. Thus, selecting marketing mixes of Garg has nothing to do with grouping of products by substitutability.

Hence, even if one were to combine Ouimet et al. with Garg, this combination does not teach or suggest "[c]reating . . . a plurality demand groups, wherein each demand group is a group of highly substitutable products . . . wherein each said demand group is defined by a user such that, each said demand group is unique to said user" and "[c]reating . . . a demand group sales model as a function of price wherein said demand group sales model models sales for each

demand group . . ." and "[c]reating . . . product sales model by combining said demand group sales model and said internal market share model . . ." in the manner claimed in Claim 1 and 3.

As such, Claim 1 is believed allowable over the cited art. Dependent claims 2, 6-8 and 10, as depending from an allowable parent claim, are also allowable for at least the same reasons.

iii. Ouimet et al. Fails to Suggest Creating Demand Group Sales Models

The Examiner also rejected Claim 1 stating "Ouimet et al. discloses: … Creating, using the computer system, a demand group sales model as a function of price wherein said demand group sales model **models sales for each demand group**, (col. 6, lines 5-11, [shows a one-dimensional demand model which scales the amount of sales, in this case, the variables are simply the prices {p}, and demand parameters qi scales the amount of sales and gi, which describes the sensitivity of the item to price])" (Emphasis added).

Appellants respectfully disagree with the Examiner's statement, in that Ouimet '893 does not teach or suggest **modeling the sales for the entire demand group** as in Claim 1. Contrary, Ouimet et al. discloses "a system of coupled equations that **describe the demand for each item** . . ." (Emphasis Added). (See Column 5, lines 60 to 63). Ouimet et al. discloses the possible use of a "demand model in which there is nonlinear cross-correlation between the variables of different items;" however, here demand models are still generated for *each item*. (See column 6, lines 12-16). There appears to be no suggestion in Ouimet et al. of determining a demand model for the entire 'group'.

While seemingly a minor distinction, the generating a demand model for demand groups requires significantly fewer resources over an optimization that utilizes demand models for every item. This reduction in processing resources enables faster, more frequent, more widely available and more complete price optimizations.

Previously, however, finding demand for a group was considered counter intuitive in that it did not provide data on individual products as is required for optimization. The present invention, however, discloses a system for decoding the group demand models to generate product specific data. As such, the present invention represents a vastly improved method for generating demand model data. Moreover, the present invention is nonobvious for at least the same reasons.

As such, Claim 1 is believed allowable over the cited art. Dependent claims 2, 6-8 and 10, as depending from an allowable parent claim, are also allowable for at least the same reasons.

iv. Ouimet et al. Fails to Suggest Creating Product Sales Models

The Examiner also rejected Claim 1 stating Ouimet et al. discloses "[c]reating, using the computer system, said **product sales model by combining said demand group sales model and said internal market share model**, wherein said product sales model models sales for individual products, further wherein said product sales model combines said demand group sales model and said internal market share model to produce said product sales model for individual products, (Col. 6, lines 63-64, where the user **selects a figure-of-merit function to be used to tune the demand model to the sales history**, thereby creating a resulting demand model that conforms to the portions of the sales history data that shows a strong trend, and conform to the external market information when the corresponding portions of the sales history data show noise as shown in the abstract, lines 13-17, w/Col. 6, lines 12-15, shows a demand model which the is a nonlinear, cross-correlation between the variables of different items, which represent individual products)." (Emphasis added).

Appellants respectfully disagree with the Examiner's statement, in that Ouimet '893 does not teach or suggest **creating product sales model by combining said demand group sales model and said internal market share model** in the manner of Claim 1. In fact, since Ouimet et al. does not appear to even contemplate the generation of market share models, it is impossible for Ouimet et al. to suggest the generation of product sales models as claimed.

Moreover, Ouimet et al. appears to "**tune** the demand model **to sales history**" using a "figure-of-merit function." (Emphasis added). (See Column 6, lines 63-65). Figure-of-merit functions are well known in the art as used to characterize the performance of a model relative to actual data. Thus the cited reference appears to be entirely concerned with tuning of the demand model of Ouimet et al. to better fit "sales history." (See Column 6, line 64).

Contrary, in the present invention, the share model and the demand model are utilized to compute the product demand model. This **combination of models to generate a unique demand model** is distinct from a simple **tuning process** which simply **adjusts** the existing model **to better fit a data set**.

Thus, while Ouimet et al. may result in tuned demand models for individual products, those demand models are arrived at in a very different way as those of the present invention. The demand models of Ouimet et al. result in different demand coefficients than the present invention. Also, Ouimet et al. is greatly limited by computing resource availability, as opposed to the present invention which is highly efficient and capable of large scale demand modeling with fewer resources.

As such, Claim 1 is believed allowable over the cited art. Dependent claims 2, 6-8 and 10, as depending from an allowable parent claim, are also allowable for at least the same reasons.

v.   Ouimet et al. Fails to Suggest Defining Equivalizing Factors

Regarding Claim 6, the Examiner has stated that "Ouimet et al. discloses: Defining an equivalizing factor for the products of each demand group, (Col. 4, line 66-Col. 5, line 6)."

Appellants respectfully disagree with the Examiner's findings. The cited reference by the Examiner discloses that "the user selects a figure-of-merit function, which is a function that attains a minimum value when the parameters of a model are adjusted to match as closely as possible to known data." (See Column 4, line 66-Col. 5, line 6). A figure-of-merit function is unsuitable to be used to equivalent volumes, or sizes, of products to one another. The cited art

appears to have nothing to do with equivalizing factor or demand groups as disclosed in the present invention. Instead the cited art appears to only be concerned with tuning demand models to "sales history." (See Column 5, line 5). As such, Claim 6 is believed allowable over the cited art for at least these reasons.

4. REGARDING CLAIMS 3 AND 4

Claims 3, 4 and 9 have been rejected by the Examiner in light of Ouimet et al. (US 6,078,893), in view of Chavez et al. (US 6,684,193). Appellants believe this rejection is erroneous and unfounded. Below is a listing of arguments where Ouimet et al. and Chavez et al. are contrasted with the Claimed invention. It will become clear that Ouimet et al. and Chavez et al. do not make the present invention obvious in that they differ greatly in regard to scope, breadth, thrust and means of accomplishing their respective objectives.

i. Chavez et al. is a Non-Analogous Art

Appellants believe that Chavez et al. is non-analogous art, and is thus inappropriate as use as prior art. This argument is made in addition to the distinguishing arguments found below.

The court has found "the similarities and differences in structure and function of the inventions to carry far greater weight" in determining if references are analogous art. *In re Ellis*, 476 F.2d 1370, 1372, 177 USPQ 526, 527 (CCPA 1973). Chavez et al. teaches a system and method for resource allocation within a firm and, more generally, modeling of objects. See abstract, see also Column 1, lines 5-13. While models are disclosed in Chavez et al., these models differ greatly in form, variables, purpose and results from the sales and market share models of the present invention. See Chavez et al., Column 15, line 45 to Column 16, line 27. See also page 62, line 11 to page 72, line 8 of the specification as filed.

Appellants assert that object modeling is distinct from and unrelated to pricing optimization. As such, rejections to Claim 3 are moot, and Claim 3 is believed allowable.

Dependent claims 4, 9 and 11, as depending from an allowable parent claim, are also allowable for at least the same reasons.

ii. Chavez et al. Fails to Suggest an Econometric Engine

Regarding Claim 3, the Examiner states that "Chavez et al discloses: Computer program instructions which . . . generate **an econometric engine for modeling sales as a function of price**, (Col. 7, lines 5-10 and lines 58-62, shows using the economical model to balance the amount of money brought in from sales against the costs)." (Emphasis Added).

Appellants respectfully disagree with the Examiner's findings. The models utilized by Chavez et al. are used for "allocation of resources" and do not model sales as a function of price. See Column 6, lines 44-50; see also Column 7, lines 63-65. Further, there appears to be no mention, suggestion or hint in Chavez et al. of solving sales as a function of price.

As such, Claim 3 is believed allowable over the cited art. Dependent claims 4, 9 and 11, as depending from an allowable parent claim, are also allowable for at least the same reasons.

iii. Chavez et al. Fails to Suggest Demand Groups

Regarding Claim 3, the Examiner has stated that "Chavez et al. discloses: . . . modeling sales of all of the products in each said demand group, wherein **each said demand group is a user defined group of highly substitutable products, (**[col. 15, lines 6-14, [shows an example of how the revenue coefficient is incorporated into modeling the value function in a manner to account for interactive effects between the refinements and the resources that comprise that particular model], w/ abstract, lines 6-14, shows a model that provides a demand distribution of the refinements, w/Col. 5, lines 4-11, substitution of resources)." (Emphasis Added).

Appellants respectfully disagree with the Examiner in that Chavez et al. **substitutes** resources when particular resources are unavailable to avoid penalties or costs. See Column 5,

lines 4-12. Contrary, the present invention **groups** products that are highly substitutable into demand groups.

As such, Claim 3 is believed allowable over the cited art. Dependent claims 4, 9 and 11, as depending from an allowable parent claim, are also allowable for at least the same reasons.

iv.   Chavez et al. Fails to Suggest Demand Group Sales Models

Regarding Claim 3, the Examiner has also stated that "Chavez et al. discloses: . . . A coefficient estimator [enabled] to **create a demand group sales model as a function of price, wherein said demand group sales model provides a single model for modeling sales of all of the products in each said demand group,** wherein each said demand group is a user defined group of highly substitutable products, ([col. 15, lines 6-14, [shows an example of how the revenue coefficient is incorporated into modeling the value function in a manner to account for interactive effects between the refinements and the resources that comprise that particular model], w/ abstract, lines 6-14, shows a model that provides a demand distribution of the refinements, w/Col. 5, lines 4-11, substitution of resources)." (Emphasis Added).

Again, Appellants respectfully disagree with the Examiner in that Chavez et al. does not disclose demand groups (see above arguments). Thus, if demand groups are not contemplated by Chavez et al., then modeling sales for these groups is a logical impossibility.

As such, Claim 3 is believed allowable over the cited art. Dependent claims 4, 9 and 11, as depending from an allowable parent claim, are also allowable for at least the same reasons.

v.   Chavez et al. Fails to Suggest Internal Market Share Models

Regarding Claim 3, the Examiner has also stated that "Chavez et al. discloses: . . . **an internal market share model** . . . [col. 15, lines 6-14, [shows an example of how the revenue coefficient is incorporated into modeling the value function in a manner to account for interactive effects between the refinements and the resources that comprise that particular

model], w/ (Col. 6, lines 12-15, shows more complicated models where a demand model which the is a nonlinear, cross-correlation between the variables of different items, which represent individual products)." (Emphasis Added).

Again, Appellants respectfully disagree with the Examiner in that Chavez et al. does not appear to disclose market share models. Cross correlation between variables, as cited by the Examiner, is not the same as a market share model. Chavez et al. appears to recognize the existence of market share; however, there is no mention of modeling this. See Column 2, lines 55-57; see also Column 9, lines 37-43.

As such, Claim 3 is believed allowable over the cited art. Dependent claims 4, 9 and 11, as depending from an allowable parent claim, are also allowable for at least the same reasons.

vi.   Chavez et al. Fails to Suggest Combined Product Sales Models

Likewise, regarding Claim 3, the Examiner has also stated that "Chavez et al. discloses: ... a **combined product sales model**, wherein said product sales model models sales for individual products, further **wherein said product sales model combines said demand group sales model and said internal market share model to produce said product sales model for individual products**, [col. 15, lines 6-14, [shows an example of how the revenue coefficient is incorporated into modeling the value function in a manner to account for interactive effects between the refinements and the resources that comprise that particular model], w/ (Col. 6, lines 12-15, shows more complicated models where a demand model which the is a nonlinear, cross-correlation between the variables of different items, which represent individual products)." (Emphasis Added).

Again, Appellants respectfully disagree with the Examiner, in that Chavez et al. does not appear to disclose the combined product sales models as claimed. Contrary, Chavez et al.

discloses models for "allocation of resources" and does not model sales as a function of price. See Column 6, lines 44-50; see also Column 7, lines 63-65.

Moreover, as previously discussed, Chavez et al. does not disclose demand group sales models. Likewise, Chavez et al. does not disclose market share models as claimed. Thus, it is logically impossible for Chavez et al. to combine these two models to generate a product sales model as disclosed in the present invention.

As such, Claim 3 is believed allowable over the cited art. Dependent claims 4, 9 and 11, as depending from an allowable parent claim, are also allowable for at least the same reasons.

vii. Chavez et al. Fails to Suggest Data Cleansing

Regarding Claim 4, the Examiner has stated that "Chavez et al. discloses: Wherein the imputed variable generator receives raw data, and **cleans the data**, (Col. 20, lines 24-32, [filtering and then identifying variables])." (Emphasis Added).

Appellants respectfully disagree with the examiner, in that Chavez et al. does not appear to clean the new data. Contrary, Chavez et al. discloses filtering vast amounts of data for that which best explains "the uncertainty in the particular variable of interest." See Column 20, lines 24-32. This filtering does not appear to alter, replace, delete or materially affect the data. Instead this filtering of Chavez et al. is a selection process.

In contrast, in the claimed invention, cleansing of the new data is described in excruciating detail at page 12, line 1 to page 27, line 23. This cleansing deletes, replaces and repairs erroneous data points within the received new data. This is very different from filtering data for a desired data point. As such, Claim 4 is believed allowable over the cited art for at least these reasons.

5. REGARDING CLAIMS 2 AND 7-11

Claims 2 and 7-11 have been rejected by the examiner in light of Ouimet et al. (US 6,078,893) as applied to claim 1 above, in view of Chavez et al. (US 6,684,193), and in further view of Garg (US 6,044,357). Appellants believe this rejection is erroneous and unfounded.

Below is a listing of arguments where Ouimet et al., Garg and Chavez et al. are contrasted with the Claimed invention. In addition, all of the arguments pertaining to Ouimet et al., listed above, apply to rejections of claims 2 and 7-11. Likewise, the arguments pertaining to Chavez et al., and in particular that Chavez et al. is non-analogous art, are applied in full in the discussion of these claim rejections.

It will become clear that Ouimet et al., Garg and Chavez et al. do not make the present invention obvious in that they differ greatly in regard to scope, breadth, thrust and means of accomplishing their respective objectives.

i. Chavez et al. Fails to Suggest Product Sales Models

Regarding Claim 2, the Examiner has also stated that "Chavez et al. discloses: . . . wherein **the imputed variables are used to create the product sales model**, (Col. 20, lines 24-32, [filtering and then identifying variables], w/col. 6, lines 5-11, [shows a one dimensional demand model which scales the amount of product sales, in this case, the variables are simply prices {p}, and the demand parameters Qi scales the amount of sales and gi, which describes the sensitivity of the item to price according to product sales])." (Emphasis Added).

Appellants respectfully disagree with the Examiner in that Chavez et al. does not disclose product sales models at all (see above arguments). Moreover, there appears to be no mention in Chavez et al. of imputing variables. Examiner appears to have misunderstood the concept of 'imputation' when citing the "filtering" of actual data in Chavez et al. See Column 20, lines 24-32.

Without a key element of the claim, (i.e. imputed variables) Chavez et al. is unable to disclose "wherein the imputed variables are used to create the product sales model" of Claim 2. As such, Claim 2 is believed allowable over the cited art for at least these reasons.

ii.   Ouimet et al. Fails to Suggest Moving Averages

Regarding Claim 8, the Examiner states that "Ouimet et al discloses: Generating **a moving average** for base price; and generating **a moving average** for base volume, (Col. 6, lines 51-53, shows how values stray fro[m] those which are expected based on the average margin for an item)." (Emphasis Added).

Appellants respectfully disagree with the Examiner's findings. It is believed that the Examiner misunderstood that "moving average", which is fully defined within the specification, means an average calculated over a time period, and wherein that time period bucket changes over time. See page 28, line 21 to page 30, line 16. See also page 38, lines 10 to page 39, line 6.

Contrary, Ouimet et al. discloses an "average margin" which is compared to actual values for the purpose of applying a "penalty" to unexpected parameters which "stray" from the average margin. See Column 6, lines 51-61. This is very different from the calculation of moving averages as disclosed by the present invention. As such, Claim 8 is believed allowable over the cited art for at least these reasons.

iii.   Ouimet et al. Fails to Suggest Equivalizing Factors

Regarding Claim 10, the Examiner has stated that "Ouimet et al. discloses: defining an equivalent price for each said product using said **equivalizing factor**; defining equivalent units sold for each said product using said equivalizing factor; defining an equivalent base price for each said product using said equivalizing factor; defining equivalent base units sold for each said product using said equivalizing factor, (col. 5, lines 1-12, **shows that the figure of merit function** entered by the user, which depends upon a selected demand model is equivalent to a

standard function (x squared), and gives an example of the sales history for a particular item as it relates to the selected model, therefore any function entered by the user will have an equivalent x squared function associated with it, w/col. 6, lines 5-11, shows that price is a constant equal to the average price of the item); creating a demand group equivalent sales model based on the said equivalent price and said equivalent units sold …creating, using the computer system, an equivalent product sales model by combining said demand group equivalent sales model and said equivalent internal market share model, wherein said equivalent product sales model models equivalent sales for individual products." (Emphasis Added).

Appellants respectfully disagree with the Examiner's findings. In particular, the Examiner states that the figure of merit function is equivalent to a standard χ^2 function, and that this somehow teaches using an equivalizing factor. See Column 5, lines 1-12. The specification clearly defines the equivalizing factor as a value "to facilitate the comparisons between different size products in a demand group." See page 17, line 12 to page 18, line 16 of the specification as filed for a discussion of equivalizing factors and the means for their generation.

Thus, the equivalizing factor is a function of product size, which is clearly not mentioned, hinted at, taught, suggested or contemplated by Ouimet et al.

Furthermore, the absence of an equivalizing factor in Ouimet et al. necessarily means that Ouimet et al. is incapable of disclosing the equivalent price, equivalent base price, equivalent units or equivalent base units as is disclosed by the present invention. Likewise, it is impossible for Ouimet et al. to disclose a demand group equivalent sales model, and an equivalent product sales model. As such, Claim 10 is believed allowable over the cited art for at least these reasons.

iv.   Chavez et al. Fails to Suggest Indexing Equivalent Sales Model

Also, regarding Claim 10, the Examiner has stated that "Chavez et al. discloses: **indexing said demand group equivalent sales model** by divided said demand group equivalent sales by

baseline demand group equivalent sales, (Col. 10, lines 7-25, shows that the baseline demand is considered when dealing with modeled parameters)." (Emphasis Added).

Appellants respectfully disagree with the Examiner's findings. In particular, Chavez et al. does not appear to contemplate "equivalizing factors" as defined in the present invention. See above arguments. Thus, the absence of an equivalizing factor in Chavez et al. necessarily means that it is incapable of disclosing the demand group equivalent sales and baseline demand group equivalent sales. Without these elements, the demand group equivalent sales model may not be indexed in the manner claimed.

The Examiner provides some citation to "flex levels" between a "mean" and "desired" demand. However, Appellants do not believe this discussion within Chavez et al. is relevant to the discussion of indexing a demand group equivalent sales model. As such, Claim 10 is believed allowable over the cited art for at least these reasons.

v.   Chavez et al. Fails to Suggest Additional Econometric Variables

Regarding Claim 11, the Examiner has stated that "[Chavez et al.] discloses: … It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention for said imputed variable generator generates additional econometric variables including an imputed consumer stockpiling variable, an imputed day of the week variable, an imputed seasonality variable, an imputed promotional variable, and an imputed cross-elasticity variable with the[] motivation of providing well known econometric parameters for modeling demand."

Appellants respectfully disagree with the Examiner's findings. The Examiner fails to provide any citation, or other evidence, that inclusion of these imputed variables is in any way obvious. This is merely a conclusive statement by the Examiner of a personal belief that is unsubstantiated and unfounded.

A list of variables considered by Chavez et al. is provided at Column 20, lines 19-32; however, there appears to be no mention of any of the claimed variables within Chavez et al. Moreover, there appears to be no suggestion of a motivation to generate these variables in the disclosure of Chavez et al. As such, Claim 11 is believed allowable over the cited art for at least these reasons.

C. CONCLUSION

In sum, Appellants believe that all pending Claims 1-4, and 6-11 are allowable over the cited art and are also in allowable form and respectfully request a Notice of Allowance for this application from the Appeal Board. The commissioner is authorized to charge any fees that may be due to our Deposit Account No. 50-2766 (Order No. DEM1P003). Should the Appeal Board believe that a telephone conference would expedite the prosecution of this appeal; the undersigned can be reached at telephone number 925-570-8198.

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VIII. LISTING OF CLAIMS APPENDIX:

What is claimed is:

1.   A computer-implemented method for creating a product sales model for each of a plurality of products, the method being implemented as a plurality of program instructions stored in a computer readable storage medium in a computer system, said method comprising the steps of:

>   creating, using the computer system, a plurality demand groups, wherein each demand group is a user defined group of highly substitutable products, further wherein each demand group is a set of, at least one product and at least one of the demand groups is, a set of at least two products;

>   creating, using the computer system, a demand group sales model as a function of price wherein said demand group sales model models sales for each demand group, further wherein said demand group sales model provides a single model for modeling sales of all of the products in each said demand group;

>   creating, using the computer system, a market share model wherein said market share model determines the fraction of the sales of each demand group comprised by each product; and

>   creating, using the computer system, said product sales model by combining said demand group sales model and said internal market share model, wherein said product sales model models sales for individual products, further wherein said product sales model combines said demand group sales model and said internal market share model to produce said product sales model for individual products.

2.   The computer-implemented method, as recited in claim 1, further comprising the steps of:

        collecting, using the computer system, raw data, wherein said raw data includes product parameter data which is missing or incomplete; and

        generating, using the computer system, imputed variables from the raw data, wherein said imputed variables are used to estimate said missing or incomplete data, further wherein the imputed variables are used to create the product sales model.

3.   A computer program product in a computer-readable media, the computer program product comprising:

        computer program instructions which, when executed by a computer, cause the computer to generate an econometric engine for modeling sales as a function of price, the engine further comprising:

        an imputed variable generator for generating imputed econometric variables including a base price variable and a base volume variable, wherein said base volume variable represents the volume of product units sold in the absence of discount pricing or other promotional effects; and

        a coefficient estimator coupled to the imputed variable generator, and wherein imputed variables generated by the variable generator are used by the coefficient estimator to create a demand group sales model as a function of price, wherein said demand group sales model provides a single model for modeling sales of all of the products in each said demand group, wherein each said demand group is a user defined group of high substitutable products, an internal market share model, and a combined product sales model wherein said product sales model models sales for individual products, further wherein said combined product sales model combines said demand group sales model and said internal market share model to produce said product sales model for individual products.

4.   The computer program product, as recited in claim 3, wherein the imputed variable generator receives raw data, and cleans the data.

5.   (Previously Canceled)

6.   The computer-implemented method as recited in claim 2, further comprising the steps of:

            defining an equivalizing factor for the products of each demand group.

7.   The computer-implemented method as recited in claim 2 wherein said imputed variables comprise an imputed base price variable and an imputed base volume variable.

8.   The computer-implemented method as recited in claim 7, further comprising the steps of:

            generating a moving average for base price; and

            generating a moving average for base volume.

9.   The econometric engine as recited in claim 4 wherein said raw data includes missing or incomplete data sets.

10.   The computer-implemented method as recited in claim 8, further comprising the steps of:

            defining an equivalent price for each said product using said equivalizing factor;

            defining equivalent units sold for each said product using said equivalizing factor;

defining an equivalent base price for each said product using said equivalizing factor;

defining equivalent base units sold for each said product using said equivalizing factor;

creating a demand group equivalent sales model based on said equivalent price and said equivalent units sold;

indexing said demand group equivalent sales model by divided said demand group equivalent sales by baseline demand group equivalent sales;

creating an equivalent internal market share model based on said equivalent price and said equivalent units sold; and

creating, using the computer system, an equivalent product sales model by combining said demand group equivalent sales model and said equivalent internal market share model, wherein said equivalent product sales model models equivalent sales for individual products.

11.   The econometric engine as recited in claim 9, further wherein:

said imputed variable generator generates additional econometric variables including an imputed consumer stockpiling variable, an imputed day of the week variable, an imputed seasonality variable, an imputed promotional variable, and an imputed cross-elasticity variable; and

wherein said econometric engine utilizes a mixed-model framework wherein data across all stores and products for a selected demand group is utilized simultaneously.

IX.   **EVIDENCE APPENDIX**

X.   RELATED PROCEEDINGS APPENDIX